WE CLAIM:

1. An apparatus for balancing a pressure differential across a bearing, comprising:

an impeller on a shaft;

the impeller having an upstream side and a downstream side;

a bearing housing on the downstream side of the impeller;

the bearing housing having an upstream side and a downstream side; and

a plurality of annular grooves on the impeller;

the plurality of annular grooves concentrically situated in relation to the shaft.

2. The apparatus of claim 1, wherein the shaft has a plurality of grooves on the shaft surface.

3. The apparatus of claim 1, wherein a labyrinth seal is situated on the downstream side of the bearing housing.

4. The apparatus of claim 1, wherein the plurality of annular grooves are on the downstream side of the impeller.

5. An apparatus for balancing a pressure differential across a bearing, comprising:

an impeller on a shaft;

the impeller having an upstream side and a downstream side;

a bearing housing on the downstream side of the impeller;

a plurality of annular grooves on the downstream side of the impeller;

the plurality of annular grooves concentrically situated in relation to the shaft;

the shaft having a cylindrical outer surface; and

a plurality of grooves on the shaft.

6. The apparatus of claim 5, wherein the plurality of grooves on the shaft comprises three grooves.

7. The apparatus of claim 5, wherein the plurality of annular grooves on the downstream side of the impeller comprises three grooves.

8. The apparatus of claim 5, further comprising a fluid channel housing situated downstream from the bearing housing; and

a fluid channel traveling through the fluid channel housing.

9. The apparatus of claim 8, wherein a base of the fluid channel housing is situated just above the outer surface of the shaft.

10. An apparatus for balancing a pressure differential across a bearing, comprising:

an impeller on a shaft;

the impeller having an upstream side and a downstream side;

a bearing housing on the downstream side of the impeller;

a plurality of annular grooves on the downstream side of the impeller;

the plurality of annular grooves concentrically situated in relation to the shaft; and

a labyrinth seal situated downstream from the bearing housing;

the labyrinth seal including a plurality of discs.

11. The apparatus of claim 10, wherein the labyrinth seal includes four discs.

12. The apparatus of claim 10, wherein the plurality of annular grooves on the downstream side of the impeller comprises three grooves.

13. The apparatus of claim 10, wherein the shaft comprises aluminum.

14. The apparatus of claim 10, wherein the impeller comprises aluminum.

15. The apparatus of claim 10, further comprising a fluid channel housing situated downstream from the bearing housing; and

a fluid channel traveling through the fluid channel housing.

16. The apparatus of claim 15, wherein a base of the fluid channel housing is situated just above the outer surface of the shaft.

17. A die cast aluminum compressor housing, comprising:

an impeller on a shaft; the shaft within a bore in a compressor housing;

the impeller having an upstream side and a downstream side;

a bearing housing on the downstream side of the impeller;

a plurality of annular grooves on the downstream side of the impeller;

the plurality of annular grooves concentrically situated in relation to the shaft;

the shaft having a cylindrical outer surface; and

a plurality of grooves on the cylindrical outer surface of the shaft.

18. The apparatus of claim 17, further comprising a fluid channel housing situated downstream from the bearing housing; and

a fluid channel traveling through the fluid channel housing.

19. The apparatus of claim 18, wherein a base of the fluid channel housing is situated just above the outer surface of the shaft.

20. The die cast aluminum compressor housing of claim 17, wherein the plurality of annular grooves on the downstream side of the impeller comprises three grooves.

21. The die cast aluminum compressor housing of claim 17, wherein the shaft comprises aluminum.

22. The apparatus of claim 17, wherein the plurality of grooves on the cylindrical outer surface of the shaft comprises three grooves.

23. A method of balancing pressure within a compressor housing, comprising:

providing annular grooves on an impeller;

rotating the impeller with a shaft;

positioning a bearing housing around the outer circumference of the shaft and downstream from the impeller; and

counteracting a pressure differential across the bearing housing.

24. The method of claim 23, wherein the plurality of annular grooves are on the downstream side of the impeller.

25. The method of claim 23, wherein the shaft further comprises a plurality of grooves.

26. A method of balancing pressure within a compressor housing, comprising:

providing annular grooves on an impeller;

using a shaft to rotate the impeller;

positioning a bearing housing around the outer circumference of the shaft and downstream from the impeller;

positioning a labyrinth seal downstream from the bearing housing; and

counteracting a pressure differential across the bearing housing.

27. The method of claim 26, wherein the plurality of annular grooves are on the downstream side of the impeller.

28. The method of claim 26, wherein the labyrinth seal comprises a plurality of discs.

29. The method of claim 28, wherein the plurality of discs comprises four discs.

30. A method of compressing a gas without causing bearing lubricant leak, comprising:

flowing a gas into a compressor housing;

applying aerodynamic resistance to the gas;

directing the gas through and around a bearing; and

directing the gas across an outer surface of a shaft.

31. The method of claim 30, wherein the last step is followed by a step of applying aerodynamic resistance to the gas.

32. The method of claim 30, wherein the gas directed across the outer surface of the shaft is directed adjacent to a labyrinth seal.